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eDocket No.: 80054(302721)
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Koji Watanabe et al.

Application No.: 10/589,822

Confirmation No.: 2431

Filed: August 17, 2006

Art Unit: 2821

For: DISCHARGE LAMP BALLAST AND
PROJECTOR

Examiner: T. X. Le

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Office Action dated January 24, 2008, please amend the above-captioned U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 3 of this paper.

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A discharge lamp ballast, comprising:

a power converter that includes at least one switching element and is connected between a power source and a high intensity discharge lamp; and

a control circuit that controls an on/off state of the switching element so as to provide prescribed lamp power for the lamp based on lamp power control after the start of the lamp;

wherein, after the start of the lamp, the control circuit, based on high power control, controls the on/off state of the switching element so that at least one of an effective value and a peak value of the lamp power provided for the lamp is increased more than that adjusted by constant lamp power control ~~based on high power control after the start of the lamp~~, said constant lamp power control being control for adjusting the effective value of the lamp power provided for the lamp to a prescribed power value.

REMARKS

Claims 1-23 are pending in this application, of which claim 1 has been amended. No new claims have been added.

Claims 1, 8-9 and 16 stand rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent 6,437,515 to Kamoi et al. (hereafter "**Kamoi et al.**")

Applicants respectfully traverse this rejection.

Claim 1 of the instant application is directed to a control circuit for a discharge lamp ballast, in which, after the start of the high intensity discharge lamp, the control circuit, based on high power control, controls the on/off state of the switching element so that at least one of an effective value and a peak value of the lamp power provided for the lamp is increased more than that adjusted by constant lamp power control, wherein the constant lamp power control is control for adjusting the effective value of the lamp power provided for the lamp to a prescribed power value.

Kamoi et al discloses a discharge lamp lighting device which comprises a D.C. power supply, a load resonance circuit including an inductor, a capacitor and a discharge lamp; a polarity inverting circuit including at least a series circuit of first and second switching elements connected in parallel to the D.C. power supply for converting a D.C. power received from the D.C. power supply into an A.C. power to supply it to the load resonance circuit; and a control circuit for turning ON and OFF the switching elements alternately at a high frequency to alternately generate a first period during which an ON duration of the second switching element is longer than that of the first switching element and a second period during which the ON duration of the second switching element is shorter than that of the first switching element, to thereby apply a rectangular-shaped low frequency voltage to the discharge lamp. The control circuit superimposes a D.C. component in an output of the polarity inverting circuit upon a resonance pulse signal from the load resonance circuit to continuously change a switching frequency of the switching elements for the predetermined time from the start time point of one of the first and second periods, and supplies to the discharge lamp a

first energy necessary for starting and lighting the discharge lamp with a high pulse voltage obtained through LC resonance and also for smoothly shifting the lamp to an arc discharge state.

The Examiner has urged that FIG. 16e of Kamoi et al. discloses:

... the control circuit controls the on/off state of the switching element [switching component] so that at least one of an effective value and a peak value (figure 16e shows an effective value and a peak value of the lamp current for starting up the lamp at the second period of time [II]) of the lamp power provided for the lamp is increasing more than that adjusted by constant lamp power control (having a constant power control at the third period of time of which are having a value smaller than the effective value or the starting up value of the lamp current) based on high power control after the start of the lamp, the constant lamp power control being control for adjusting the effective value of the lamp power provided for the lamp a prescribed power value (figure 16e).

Applicants respectfully disagree.

Kamoi et al. discloses a ballast configured to increase the lamp current immediately after starting the discharge lamp to improve the startability of the lamp (column 13, line 65 to column 14, line 2). In the Office Action, the Examiner urged that the control for the constant duration τ in FIG. 16 corresponds to the high power control of the present invention, and also the control for the duration of I2 after τ corresponds to the constant lamp power control of the present invention.

In the duration of I2, each of the lamp voltage V_{la} and the lamp current I_{la} is constant, and, accordingly, the Examiner concludes that the control for the duration I2 corresponds to the constant lamp power control of the instant invention.

However, the control for the constant duration τ is different from the high power control of the instant invention in that the control for the constant duration τ corresponds to the "lamp current control" in the first embodiment of the instant application (see paragraph [0073] of the specification of the instant application). In the lamp current control, in order to shorten rise time of the light output, a target value of the target current is set to a value for flowing a comparatively large lamp current

(current larger than the rated lamp current) in a prescribed time period immediately after the start (see paragraph [0075] of the specification of the instant application.) That is, the constant duration τ corresponds to the prescribed time period of the lamp current control, and the lamp current I_{la} in the constant duration τ corresponds to a current greater than the rated lamp current.

Moreover, lamp power in the constant duration τ includes lower power than that in the stationary state (the duration of I_2), especially in the beginning of τ , and accordingly, the control for the constant duration τ does not correspond to the high power control of the invention by which an effective value and/or a peak value of the "lamp power" is increased more than that by the constant lamp power control.

Accordingly, claim 1 has been amended to clarify this distinction, and the 35 U.S.C. §103(a) rejection should be withdrawn.

Claims 22-23 stand rejected under 35 U.S.C. §103(a) as unpatentable over Kamoi et al in view of U.S. Patent 6,992,718 to Takahara (hereafter "Takahara").

Applicants respectfully traverse this rejection.

Takahara has been cited for teaching a projector comprising a color filter whose transmission color by light from the light source and the control circuit synchronizes timing of polarity inversion of the lamp voltage applied across the lamp, but like Kamoi et al discussed above, fails to teach, mention or suggest the features recited in claim 1, as amended, from which these claims depend.

Thus, the 35 U.S.C. §103(a) rejection should be withdrawn.

The Examiner has indicated that claims 2-7, 10-15 and 17-21 would be allowable if rewritten in independent form. Applicants respectfully defer this action until a FINAL Office Action is received.

In view of the aforementioned amendments and accompanying remarks, claims 1-23, as amended, are in condition for allowance, which action, at an early date, is requested.

The Examiner is hereby authorized to charge or credit any fees associated with this Amendment to Deposit Account No. 04-1105.

Dated: April 24, 2008

Respectfully submitted,

By _____
William L. Brooks
Registration No.: 34,129
EDWARDS ANGELL PALMER & DODGE
LLP
P.O. Box 55874
Boston, Massachusetts 02205
(202) 478-7376
Attorneys/Agents For Applicant